CLAIMS

What is claimed is:

1. A device for displaying an image having first and second image portions in response to an image signal, comprising:

a scanning mirror mounted for periodic motion through a selected scanning angle;

a driver coupled to the scanning mirror and operative to sweep the scanning mirror through the selected scan pattern;

a first light source responsive to a first input signal to emit a first modulated light beam along a first light path relative to the first light source, the first light source being oriented such that the first light path strikes the scanning mirror at a first angle at which the scanning mirror reflects the first modulated light beam to a first image region in which the first modulated light beam defines the first image portion;

a second light source responsive to a second input signal to emit a second modulated light beam along a second light path relative to the second light source, the second light source being oriented such that the second light path strikes the scanning mirror at a second angle at which the scanning mirror reflects the second modulated light beam toward a second image region in which the second modulated light beam defines the second image portion, and wherein the orientation of the first and second light sources is selected such that the first and second regions are substantially non-overlapping; and

electronic control circuitry having an input port for receiving the input signal and first and second outputs coupled to the first and second light sources respectively, the control circuitry being responsive to the image signal to produce the first and second input signals.

2. The device of claim 1 wherein the first light source includes:
a light emitter; and
a modulator external to the light emitter.

3. The device of claim 1 wherein the first light source includes a directly modulatable light emitter.

4. The device of claim 1 wherein the first light source includes:
a light emitter; and
an optical fiber, optically coupled to the light emitter.

5. The device of claim 1 wherein the electronic control circuitry includes a clock circuit responsive to the image signal to produce a nonuniform clock signal having a nonuniformity corresponding to an expected nonlinearity of the scanning mirror scan pattern.

6. The device of claim 1 wherein the scanning mirror is torsionally mounted to a base.

7. The device of claim 1 further including a single light emitter that provides light for both of the first and second light sources.

8. The device of claim 1 wherein each of the first and second light sources includes a separate light emitter.

9. The device of claim 8 wherein each of the first and second light sources includes a plurality of light emitters, each at a separate wavelength.

10. The device of claim 8 wherein each of the light emitters includes an LED.

11. The device of claim 8 wherein each of the light emitters includes a laser diode.

12. An image display for producing an image in an image field, comprising:

a first light source oriented to emit a first beam along a first optical path;

a second light source oriented to emit a second beam along a second optical path that is not parallel to the first optical path, the second optical path converging with the first optical path at a convergence location;

a mirror positioned substantially at the convergence location and oriented to direct the first beam to a first region of the image field and oriented to direct the second beam to a second region of the image field different from the first region, the mirror being mounted for pivoting about a pivot axis in a forward direction and a reverse direction;

a drive mechanism coupled to the mirror and operative to pivot the mirror about the pivot axis in a predetermined scan pattern including movement in each of the forward and reverse directions; and

an electronic controller coupled to both of the first and second light sources, the controller being operative to activate the first light source when the mirror pivots in the forward direction and to activate the second light source when the mirror pivots in the reverse direction.

13. The image display of claim 12 wherein the predetermined scan pattern is biaxial.

14. The image display of claim 12 wherein each of the first and second light sources includes a respective laser.

15. The image display of claim 12 wherein each of the first and second light sources includes a plurality of light emitters, each light emitter providing light in a respective wavelength range.

16. The image display of claim 15 wherein each of the first and second light sources includes red, green, and blue light emitters.

17. The image display of claim 12 further including a common light emitter and wherein the first and second light sources share the common light emitter.

18. The image display of claim 17 further including a switch interposed between the common light emitter and each of the first and second light paths and wherein the electronic controller is coupled to the switch and operative to activate the switch.

19. A scanning apparatus, comprising:

a central scanning mirror;

a mirror actuator coupled to the mirror and operative to drive the mirror through a scanning pattern having a period;

a first light source oriented to emit a first beam of light toward the central mirror during a first portion of the period;

a second light source oriented to emit a second beam of light toward the central mirror during a second portion of the period different from the first;

an electronic light source driver coupled to the first and second light sources, the light source driver being operative to selectively actuate one or the other of the first and second light sources, wherein the first light source is oriented such that the first light beam illuminates a first area during the first portion and the second light source is oriented such that the second light beam illuminates a first area different from the first area during the second portion.

20. The scanning apparatus of claim 19 wherein the first and second light sources include a common light emitter.

21. The scanning apparatus of claim 19 wherein each of the first and second light sources includes a respective light emitter responsive to a respective current to produce the respective beam light.

22. A method of scanning a target area according to a driving signal, comprising the steps of:

emitting a first beam of light from a first location along a first path;

emitting a second beam of light from a second location along a second path different from the first path;

redirecting the first beam of light from the first path along a first periodic scan pattern to a first region of the target area;

redirecting the second beam of light from the second path along a second periodic scan pattern synchronized to the first scan pattern to a second region of the target area different from the first region;

modulating the first beam of light in response to a first portion of the driving signal;

modulating the second beam of light in response to a second portion of the driving signal.

23. The method of claim 22 wherein the step of redirecting the first beam of light from the first path along a first periodic scan pattern to a first region of the target area includes:

receiving the first beam of light with a scanning apparatus; and

scanning the first beam of light through the first periodic scan pattern with the scanning apparatus.

24. The method of claim 23 wherein the step of redirecting the second beam of light from the second path along a second periodic scan pattern synchronized to the first scan pattern to a second region of the target area different from the first region includes:

receiving the second beam of light with the scanning apparatus; and

scanning the second beam of light through the second periodic scan pattern with the scanning apparatus.

25. The method of claim 24 wherein the scanning apparatus includes a scanning mirror and wherein scanning the first beam of light through the first periodic scan pattern and scanning the second beam of light through the second periodic scan pattern include moving the mirror along a mirror scan path.

26. The method of claim 25 wherein the step of modulating the first beam of light in response to a first portion of the driving signal occurs during a first interval in which the mirror is in a first portion of the mirror scan path in the step of modulating the second beam of light in response to a second portion of the driving signal occurs during a second interval different from the first interval in which the mirror is also in the first portion of the mirror scan path.

27. A method of correcting raster pinch in a scanned image capture or display system including a scanning apparatus, comprising the steps of:

activating the scanning apparatus for periodic scanning over a plurality of scanning periods;

during a first portion of each of the scanning periods defining a first scan path between a first optical device and the target area by directing light to or receiving light from the target area with the scanning apparatus;

during a second portion of each of the scanning periods different from the first portion defining a second scan path between the second optical device and the target area by directing light to or receiving light from the target area with the scanning apparatus; and

orienting the first optical device, second optical device and scanning apparatus such that the first and second scan paths define immediately adjacent and substantially nonoverlapping regions in the target area.

28. The method of claim 27 wherein the first and second optical devices are light emitters, further including activating the first optical device only during the first portion of each of the scanning periods and activating the second optical device only during the second portion of each of the scanning periods.

29. The method of claim 27 wherein each of the first and second scan paths are substantially along the common axis.

30. The method of claim 29 further including translating the first scan path along a second axis different from the common axis during the second portions of the scanning periods.

31. The method of claim 30 further including translating the second scan path along the second axis during the first portions of the scanning periods.

32. A method of producing an image for viewing, comprising the steps of:

emitting a first light beam from a first location;

resonantly scanning the first light beam about a first axis at a first frequency;

scanning the first light beam about a second axis different from the first axis at a second frequency, while continuing to scan the first light beam about the first axis;

emitting a second light beam from a second location different from the first location;

resonantly scanning the second light beam about the first axis at the first frequency;

scanning the second light beam about the second axis at the second frequency, while continuing to scan the second light beam about the first axis;

modulating the first light beam in a pattern corresponding to a first portion of the image, synchronously with the step of resonantly scanning the first light beam about the second axis; and

modulating the second light beam in a pattern corresponding to a second portion of the image different from the first portion, synchronously with the step of resonantly scanning the second light beam about the second axis; and

wherein the steps of emitting the first light beam and emitting the second light beam are temporally nonoverlapping.

33. The method of claim 32 wherein the steps of resonantly scanning the first and second light beams about the first axis includes:

oscillating a turning mirror at the first frequency; and

redirecting the first and second light beams with the oscillated turning mirror.

34. The method of claim 32 wherein the step of resonantly scanning the first and second light beams about the second axis includes:

pivoting the turning mirror at the second frequency; and

redirecting the first and second light beams with the turning mirror.